

Calculus I

Name: _____

Study Guide 5

Class: _____

Due Date: _____

Score: _____

No Work $\Leftrightarrow$ No Points

Use Pencil Only $\Leftrightarrow$ Be Neat & Organized

1. (4 points) Find $\lim_{x \rightarrow a} f(x)$ and $\lim_{x \rightarrow a} g(x)$ if

$$\begin{cases} \lim_{x \rightarrow a} [3f(x) - 2g(x)] = 11 \\ \lim_{x \rightarrow a} [2f(x) + 3g(x)] = 3 \end{cases}$$

1. _____

2. (4 points) For any given $\epsilon > 0$, find $\delta > 0$ such that $\lim_{x \rightarrow 4} \left(\frac{1}{4}x - 1 \right) = 0$.

2. _____

3. (4 points) For any given $\epsilon > 0$, find $\delta > 0$ such that $\lim_{x \rightarrow -5} (-3x + 2) = 17$.

3. _____

4. (4 points) For any given $\epsilon > 0$, find $\delta > 0$ such that $\lim_{x \rightarrow 0} \sqrt[5]{x} = 0$.

4. _____

5. (5 points) For any given $\epsilon > 0$, find $0 < \delta \leq 1$ such that $\lim_{x \rightarrow 1} \sqrt{x} = 1$.

5. _____

6. (4 points) Evaluate $\lim_{x \rightarrow 0} f(x)$ if $x^3 + x^2 \leq f(x) \leq \frac{x^2}{x-1}$ for all $x \in (-1, 1)$.

6. _____

7. (5 points) For any given $\epsilon > 0$, find $\delta > 0$ such that $\lim_{x \rightarrow -3} (|x| - 4) = -1$.

7. _____

8. (4 points) For any given $\epsilon > 0$, find $\delta > 0$ such that $\lim_{x \rightarrow -3} (x^2 + 6x) = -9$.

8. _____

9. (4 points) Evaluate $\lim_{x \rightarrow a} \frac{x^4 - a^4}{x^2 - a^2}$.

9. _____

10. (4 points) Evaluate $\lim_{x \rightarrow 0} \frac{x}{\sqrt{3+2x} - \sqrt{3-2x}}$.

10. _____

11. (4 points) Evaluate $\lim_{h \rightarrow 0} \frac{f(x+h) - 2f(x) + f(x-h)}{h^2}$ for $f(x) = mx$.

11. _____

12. (4 points) Evaluate $\lim_{h \rightarrow 0} \frac{f(x+h) - 2f(x) + f(x-h)}{h^2}$ for $f(x) = ax^2$.

12. _____